

USSR

BRESLAV, I. S., et al., Fiziologicheskii Zhurnal SSSR, No 12, 1971, pp 1,766-1,773

breathing and disruptions were much less frequent than in the newcomers. In the experiments with an increased level of lung ventilation requiring the inhalation of mixtures containing 3% CO₂ and different amounts of oxygen, the subjects readily tolerated both hypoxic and hypercapnic mixtures, but reported shortness of breath when inhaling ordinary air.

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USSR

UDC 612.014.41

BRESLAV, I. S., VOLKOV, B. N., and MITUSHOV, V. M., Laboratory of Respiratory Physiology, Institute of Physiology imeni I. P. Pavlov, Academy of Sciences USSR

"Recording Human Respiration in Pressure Chamber Experiments"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, No 5, 1970, pp 805-807

Abstract: The parameters of human respiration in a pressure chamber often have to be recorded in experiments designed to study the effect of a rarefied atmosphere and hypoxia on physiological functions. However, there are some difficulties in carrying out such experiments, e.g., the small size of the chamber cannot accommodate a clumsy piece of apparatus like a spiograph, and if the spiograph is placed outside, it cannot function normally because of the difference in air pressures inside and outside the chamber. A further complication arises when the subject is required to inhale gaseous mixtures of different compositions. To overcome these difficulties, the authors designed a compensating valve that is mounted in the wall of a standard PBK-53 pressure chamber. The subject inhales gaseous mixtures from a spiograph passed through tubes connected to the valve.

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USSR

UDC 616.273.2:612.208

AGADZHANYAN, N. A., BRESLAV, I. S., KONZA, E. A., USAKOVA, N. A., and
YELFIMOV, A. I., Institute of Physiology imeni I. P. Pavlov, Academy of
Sciences USSR, Leningrad

"The Role of Peripheral Chemoreceptors in Reactions of Rats Subjected to Short-
Term and Prolonged Hypoxia"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 74, No 10, 1972,
pp 11-15

Abstract: The role of the deafferentated synocarotid and aortic reflectogenic zones on respiratory, cardiovascular, and thermoregulatory activities of rats subjected to hypoxia was studied. The ventilation in intact rats breathing with the air containing 11% ($PO_2 = 83.6$ mm Hg), increased by 20.3% compared with the normal air respiration. No noticeable changes were observed on rats with deafferentated synocarotids on both sides and breathing with the same hypoxia mixture. The same was true for rats with deafferentated aortic zone. A rapid elevation (25 m/sec) of intact rats to 1000-7000 m produced a rapid breathing. The same was observed in deafferentated rats but it occurred much later and was 15-25% lower than in intact rats. The number of heart beats in both groups of animals increased, without any significant difference between them. The severe hypoxia at 7000 m inhibited sharply both the respiration and

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AGADZHANYAN, N. A., et al., Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 74, No 10, 1972, pp 11-15

the cardiovascular activity. A decrease in the pO_2 in the thigh muscle of the deafferented rats was more noticeable under severe hypoxia. When animals spent 30 min at 5000 m elevation ($pO_2 = 85$ mm Hg), the number of respirations increased during the first 10 min and was high during the entire exposition time, but was lower in deafferented rats. There were no significant differences in the reactions of the cardiovascular and thermoregulatory systems at this elevation. A complete exclusion of the synocarotid chemoreceptors lowered in pO_2 pressure in the thigh muscles of the deafferented rats at 5000 m elevation (barochamber) with low oxygen concentration. Intact and deafferented rats died within 86 and 68 seconds, respectively at 18,000 m elevation. No significant changes in the ventilation system were observed among both groups of rats placed in chambers with 11% oxygen for 30 days. It is concluded that the peripheral chemoreceptors play a definite role in a total adaptation of the animal organism to oxygen deficiency. At the same time, the synocarotid chemoreceptors do not play any significant role in reactions of the cardiovascular and thermoregulatory systems in response to hypoxia. Since the synocarotid deafferentation did not produce significant changes in the adequate ventilation in response to hypoxia it can be assumed that other chemosensitive systems, yet unknown, take part in this process.

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UDC 77

BRESLAV, YU. A. KOTOV, A. G.

"EPR in Photoemulsion Crystals of Silver Bromide"

V sb. Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti (International Congress on Photographic Science, Moscow, 1970, Nature of Photographic Sensitivity -- Collection of Works), no place of publication given, Vneshtorgizdat, no year given, pp 135-138 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1323)

Translation: The EPR at different stages in the chemical aging of ammonium AgBr emulsion was investigated after gamma-irradiation from a Co^{60} source in air or in a vacuum at -196°C . Components belonging to NO_2 molecules absorbed on the surface of microcrystals, NO_3^- paramagnetic particles, and O_2^- ion radicals were identified in the EPR spectrum. If AgNO_3 is replaced by AgClO_3 in the synthesis of AgBr, a component corresponding to the ClO_3^- radical appears instead of components corresponding to NO_2 and NO_3^- . O_2^- adsorbed on the surface displayed the capacity to compete with sensitivity centers and other electron showers and

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BRESLAV, YU. A., KOTOV, A. G., Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti, no place of publication given, Vneshtorgizdat, no year given, pp 135-138

even to keep electrons localized by these centers in the adsorption of oxygen after irradiation. The role of surface admixtures is thus very considerable in electron processes in the irradiation of microcrystals. The EPR spectrum also displayed two components associated with two types of paramagnetic particles, the concentrations of which (especially of one type) decrease during aging; they are possibly charge carriers stabilized on the surface. A. L. Kartuzhanskiy.

1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--PARAMAGNETIC CENTERS IN IRRADIATED SYNTHETIC ZEOLITES -U-
AUTHOR--(02)-BRESLAV, YU.A., KOTOV, A.G.
COUNTRY OF INFO--USSR **B**
SOURCE--KHIM. VYS. ENERG. 1970, 4(2), 149-53
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY
TOPIC TAGS--PARAMAGNETISM, ZEOLITE, GAMMA RADIATION, EPR SPECTRUM, HIGH
TEMPERATURE EFFECT, CALCIUM, STRONTIUM, CATION

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0758 STEP NO--UR/0456/70/004/002/0149/0153
CIRC ACCESSION NO--AP0119665
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119665

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF THE ACTIVATION TEMP. (T SUB1) AND THE TEMP. OF GAMMA, IRRADN. OF MA ZEOLITES, M EQUALS LI, NA, K, RB, CS, CA, AND SR, ON THE EPR SPECTRA OF PARAMAGNETIC CENTERS WAS STUDIED BY A METHOD DESCRIBED PREVIOUSLY (BRESLAV, ET AL., 1967). A CHANGE IN T SUB1 OF 350-550DEGREES DID NOT AFFECT THE NO. OF CENTERS NOR THE FORM OF THE SPECTRUM OF NAA IRRADIATED AT 77DEGREESK. AT HIGHER TEMPS., SMALLER THAN OR EQUAL TO 750DEGREES, THE NO. OF CENTERS INCREASED, BUT THE SPECTRUM DID NOT CHANGE. AFTER IRRADN. AT ROOM TEMP., THE EPR SPECTRUM CONSISTS OF 6 COMPONENTS. THE G, FACTOR AT THE INTERSECTION WITH THE ZERO LINE WAS 2.020 PLUS OR MINUS 0.0005 OE. ADSORPTION OF NH SUB3 OR O DID NOT AFFECT THE INTENSITY OF THE SPECTRA. THE SPECTRA OF CAA AND SRA IRRADIATED AT ROOM TEMP. AND ACTIVATED AT 400-50DEGREES CONSIST FO 2 SUPERIMPOSED SIGNALS, 1 OF WHICH IS A SINGLE LINE, 3-4 OE WIDE. ADSORPTION OF N OXIDES LOWERED THE NO. OF V CENTERS, BUT DID NOT AFFECT THE SPECTRA. EXCHANGE CATIONS M AFFECTED THE SURFACE PROPERTIES OF MA ZEOLITES IN THAT DONOR ELECTRON LEVELS OF SURFACE DEFECTS BECAME ACCEPTOR LEVELS. FACILITY: FIZ. KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

B Radiation Chemistry

UDC: 541.15

BRESLAV, YU. A. and KOTOV, A. G., Scientific Research Physico-Chemical Institute
imeni L. Ya. Karpov, Moscow, State Committee for Chemistry

"Paramagnetic Centers in Irradiated Synthetic Zeolites"

Moscow, Khimiya Vysokikh Energiy, Vol 4, No 2, 1970, pp 149-153

Abstract: The present study was intended to supplement earlier research showing that it is surface F- and V-centers resulting from gamma-radiation which support low-temperature radiation-catalytic conversion of molecules adsorbed on zeolites. LiA, NaA, KA, RbA, CsA, CaA and SrA, irradiated at 77 and 300°K, were used in the study of paramagnetic centers, the samples being conditioned in vacuo at various temperatures between 600 and 1,000°K. Also studied was the adsorption of paramagnetic nitrous and nitric oxides on both irradiated and unirradiated samples. It was established that replacement of an alkali metal cation with an alkali-earth cation leads to sharp alteration in surface properties: the donor electron levels of the surface defects in such replacement are converted into acceptor levels. These properties remain present when defects have been altered as a result of heat treatment, and also with change in radiation temperature.

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1/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--DEVELOPMENT OF AROMATIC HYDROCARBON INDUCED TUMORS OF THE MAMMARY
GLAND IN RATS -U-
AUTHOR--(03)-BESKROVNYI, A.M., ~~BRESLAVSKIY~~, A.S., SUKACHEVA, O.A.
COUNTRY OF INFO--USSR
SOURCE--VOP. ONKOL. 1970, 16(2), 59-63
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--TUMOR, CARCINOGEN, AROMATIC HYDROCARBON, HISTOCHEMISTRY,
REPRODUCTIVE SYSTEM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1995/2042 STEP NO--UR/0506/70/016/002/0059/0063
CIRC ACCESSION NO--AP0117285
UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AP0117285
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STUDY WAS MADE OF PATTERNS OF
GROWTH AND HISTOL. STRUCTURE OF TUMORS OF THE AMMARY GLAND, INDUCED IN
WISTAR FEMALE RATS BY ORAL ADMINISTRATION OF
9,10,DIMETHYL,1,2,BENZ(ALPHA)ANTHRACENE (1). THE TUMORS APPEARED AT
85-90PERCENT OF CASES, IN AN AV. OF 36 DAYS AFTER 3 ADMINISTRATION OF
THE CARCINOGEN. OF 200 CASES, SPONTANEOUS REGRESSION OCCURRED IN 61
WITH COMPLETE DISAPPERANCE OF THE TUMOR IN 29. IN 45 CASES, HOWEVER,
THE REGRESSION WAS TEMPORARY. A DISTINCT DEPENDENCE BETWEEN THE RATE
OF REGRESSION AND THE SIZE OF THE TUMOR WAS FOUND; SMALLER (I.E.,
YOUNGER) TUMORS HAD A HIGH INCIDENCE OF REGRESSION AND DISAPPEARANCE.
WHEN THE TUMOR REACHED A CERTAIN CRIT. SIZE, DISTINCT MALIGNIZATION
OCCURRED, THE TUMORS GREW CONTINUOUSLY AND CAUSED DEATH OF THE ANIMAL.
HISTOL. EXAMNS. SHOWED THAT I INDUCED TUMORS ARE INITIALLY PRECANCEROUS,
AND ONLY BECOME MALIGNANT IN LATER STAGES. FACILITY: INST. EXP.
CLIN. UNCOL., MOSCOW, USSR.

UNCLASSIFIED

Hydraulic and Pneumatic

USSR

UDC 539.3:534.1

BRESLAVSKIY, V. Ye.

"Oscillations of Shells Reinforced With a Filler"

V sb. Konf. po kolebaniyam mekh. sistem. Tezisy dokl. (Conference on Oscillations of Mechanical Systems. Abstracts of the Reports), Kiev, "Nauk. dumka", 1971, pp 13-14 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10V127)

Translation: The author considers free and forced oscillations of closed cylindrical, conical and spherical shells reinforced on the inner surface with a viscoelastic filler. Expressions are found which define the frequencies and shapes of the natural oscillations. The peculiarities of the various types of motion are described. It is shown in which cases the first two roots of the frequency equation for a cylinder with a shell are longitudinal and radial oscillations. Analytical relations are found which define the displacements under the effect of different variable loads.

A brief description is given of the experimental procedure, and the results of experimental determination of the frequencies of radial, longitudinal and torsional oscillations are presented. The experimentally de-

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BRESLAVSKIY, V. Ye., Konf. po kolebaniyam mekh. sistem. Tezisy dokl.,
Kiev, "Nauk. dumka", 1971, pp 13-14

termined frequencies show satisfactorily agreement with the results of
computer calculations.

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USSR

UDC: 621.374.2

BRESLAVTSEV, I. D., VENIKOV, N. I., DVORNIKOV, V. D., KULESHOV,
I. L., LATUSHKIN, S. T., REZVOV, V. A., CHUMAKOV, N. I., and
YUDIN, L. I.

"Use of 'Deviation Grouping' to Obtain Intense Short Neutron
Pulses in the IAE Cyclotron"

Moscow, Pribory i Tekhnika Eksperimenta, No 4, July-August 1972,
pp 26-31

Abstract: A system is described for the formation and diagnostics of a beam of neutrons using the method of deviation grouping. Similar to that of Karlsruhe, as described by S. Cierjacks et al (Rev. Scient. Instrum., 39, 1968, p 1279), the system involves a packet of ions cut by a pulsed voltage of an internal deflector and accelerated to the proper energy level. The ions are deflected vertically to a target whose thickness is larger than the ion path, and as a result of the impact of the particles on the target, short intense neutron pulses are obtained. A detector, recording the neutrons' energy spectrum, is placed at a distance of 13.5 m from the target. Unlike the Karlsruhe cyclotron, however, the IAE has two 180° duants, such that it is impossible to place all elements of the system in the space outside them. The setup
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UDC: 621.374.2、

BRESLAVTSEV, I. D., et al, Pribory i Tekhnika Eksperimenta, No 4,
July-August 1972, pp 26-31

involving the IAE cyclotron is described, together with the electronic equipment, and a sketch of the instrumentation is given in block form. A neutron pulse frequency of as much as 110 kHz is obtained. The authors are associated with the Institute of Atomic Energy at Moscow.

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1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--KINETICS OF HOMOGENEOUS BUTADIENE POLYMERIZATION CATALYZED BY
TITANIUM CHLORIDE IODIDE, TRIISOBUTYLALUMINUM -U-
AUTHOR-(04)-BRESLER, L.S., GRECHANOVSKIY, V.A., MUZSAY, A., PODDUBNVI,
I.YA.
COUNTRY OF INFO--USSR **B**
SOURCE--MAKROMOL. CHEM. 1970, 133, 111-18
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL REACTION MECHANISM, CHEMICAL REACTION KINETICS,
BUTADIENE, MOLECULAR WEIGHT, IODINE, ORGANOALUMINUM COMPOUND, TITANIUM
CHLORIDE, POLYMERIZATION CATALYST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1992/1615 STEP NO--SZ/0000/70/133/000/0111/0113

CIRC ACCESSION NO--AP0112609
UNCLASSIFIED

2/2 020
CIRC ACCESSION NO--AP0112609

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETICS OF HOMOGENEOUS BUTADIENE POLYMERIZATION INITIATED BY TII SUB2 CL SUB2 ISO, BU SUB3 AL WAS STUDIED AT CONST. MONOMER CONC. A REACTION MECHANISM INVOLVING FAST INITIATION AND PROPAGATION OF LIVING CHAINS WITH REVERSIBLE DEACTIVATION OF THE ACTIVE SITES WAS PROPOSED. THE NO. AND WE. AV. MOL. WTS. OF THE POLYMER AT ANY MOMENT AFTER ESTABLISHING THE DEACTIVATION REACTIVATION EQUIL. WERE CALCD. FACILITY: SYN. RUBBER RES. INST., LENINGRAD, USSR.

UNCLASSIFIED

1/2 032 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--MAGNETOPHONON RESONANCE IN TELLURIUM -U-
AUTHOR--(02)-BRESLER, M.S., NASHOVETS, D.V. **B**
COUNTRY OF INFO--USSR
SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 39, NR 2, PP 421-435
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS
TOPIC TAGS--MAGNETORESISTANCE, TELLURIUM, SINGLE CRYSTAL, LIQUID NITROGEN,
PHONON, ENERGY SPECTRUM, DIPOLE MOMENT

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1234 STEP NO--GE/0030/70/039/002/0421/0435
CIRC ACCESSION NO--AP0124888
UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0124888

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN INVESTIGATION WAS MADE OF THE MAGNETORESISTANCE OF TELLURIUM SINGLE CRYSTAL SAMPLES IN MAGNETIC FIELDS UP TO 400 KOE AT LIQUID NITROGEN TEMPERATURES FOR DIFFERENT RELATIVE ORIENTATIONS OF MAGNETIC FIELD, SAMPLE CURRENT, AND CRYSTAL THREEFOLD AXIS. FOR THE INTERPRETATION OF THE OBSERVED MAGNETOPHONON RESONANCE OSCILLATIONS THE SYSTEM OF LANDAU LEVELS FOR THE TELLURIUM VALENCE BAND IS CALCULATED IN THE QUASI CLASSICAL APPROXIMATION TAKING INTO ACCOUNT THE PHENOMENA RELATED TO THE PRESENCE OF A SADDLE POINT IN THE BAND ENERGY SPECTRUM (INTRABAND MAGNETIC BREAKDOWN). THE LONG WAVELENGTH OPTICAL VIBRATIONS IN THE TELLURIUM LATTICE ARE DISCUSSED. IT IS SUGGESTED THAT FROM THREE OPTICAL PHONON MODES INDUCING THE FIRST ORDER DIPOLE MOMENTS ONE MODE PREDOMINATES IN CARRIER SCATTERING. THE CALCULATED POSITIONS OF THE MAGNETOPHONON OSCILLATIONS ARE IN GOOD AGREEMENT WITH EXPERIMENT. FACILITY: INSTITUTE OF SEMICONDUCTORS, ACADEMY OF SCIENCES OF THE USSR.

UNCLASSIFIED

USSR

UDC 543.422.4(088.8)

BRESLER, P. I., Candidate of Sciences, and SEMENOVA, M. V.

"Absorption Colorimetric Analyzer with Luminescent Screen"

Optiko Mekhanicheskaya Promyshlennost', No 12, 1972, pp 33-34.

Abstract: An absorption colorimetric analyzer with a luminescent screen is studied, designed for visual determination of the content of impurities absorbing ultraviolet light in various liquid and gas media. Results are presented from studies of a model of the analyzer using the determination of phenol in water as an example. Experimental studies showed that the analyzer, with a working quevette length of 10 mm, can detect about 13 mg/l phenol in water. A multipath quevette could be used for detection of mercury vapor in air.

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USSR

UDC 543.42

BRESLER, P. I., Candidate of Sciences, SEMENOVA, M. V., SHILIERMAN, G. A.

"Single-Beam Ultraviolet Gas and Liquid Analyzer"

Optiko-mekhanicheskaya Promyshlennost', No 10, 1971, pp 32-34.

ABSTRACT: A single-beam ultraviolet gas and liquid analyzer with luminescent convertor, placed in a flux of radiant energy alternately before and after the sample container is described. The results of testing of a model of the analyzer are presented. The new design significantly improves technical characteristics of the device while reducing the requirements for temperature constancy of the optical system. During a four-day test, deviation of the readings of the analyzer did not exceed $\pm 1.5\%$, and indications were found to be essentially independent of surrounding temperature between 4 and 50°C.

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USSR

UDC 615.281.8:547.963.32

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AKSENOV, O. A., TIMKOVSKIY, A. L., AGEYEVA, O. N., KOGAN, E. M., BRESLER, S. Ye., SMORODINTSEV, Al. A., and TIKHOMIROVA-SIDOROVA, N. S., All-Union Scientific Research Influenza Institute, Ministry of Public Health USSR, Institute of Nuclear Physics, Academy of Sciences USSR, and Institute of High Molecular Weight Compounds, Academy of Sciences USSR, Leningrad

"Interferonogenic and Antiviral Activity of Double-Stranded Polyriboguanilic and Polyribocytidylic Acid Complex"

Moscow, Voprosy Virusologii, No 3, May/Jun 1973, pp 345-350

Abstract: The interferonogenic and antiviral activity and toxicity of (poly-G)·(poly-C) complexes produced by two methods were compared with those of (poly-I)·(poly-C). Stable complexes were formed both by adding NaCl (0.1M) to an equimolar solution of poly-G and poly-C in 0.005M sodium phosphate buffer (pH 7.4) at 20°C, and by heating the polynucleotide mixture in the same buffer for 10 min at 100°C with subsequent slow cooling. Success of the first method, not encountered in other papers, is probably due to careful purification of the polynucleotides. The double-strand complex stimulated maximum interferon formation in white mice 2-4 hours after intravenous injection. Interferon disappeared after 10-12 hours.

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AKSENOV, O. A., et al., Voprosy Virusologii, No 3, May/Jun 1973, pp 345-350

(Poly-G)·(poly-C) produced less interferon than did (poly-I)·(poly-C) (160-320 vs. 640-1,280 units/ml). The complex protected mice from lethal doses of A0/PR8 influenza virus, though (poly-I)·(poly-C) was somewhat more effective. (Poly-G)·(poly-C) was most effective when administered within 1 day of infection, while (poly-I)·(poly-C) was most effective when administered 2-3 days prior to the virus. The protective effect was higher for complex produced at 20°C than for that produced at 100°C. (Poly-G)·(poly-C) was nontoxic to white mice even at maximum dose (50 mg/kg), while (poly-I)·(poly-C) was 50 percent lethal at 10-15 mg/kg. Though (poly-G)·(poly-C) was found to be generally less effective than (poly-I)·(poly-C), its lower toxicity makes it a preferable antiviral agent.

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UDC 615.281.8:547.963.32

TIMKOVSKIY, A. L., AKSENOV, O. A., BRESLER, S. Ye., KOGAN, E. M., SMORODINTSEV, Al. A., and TIKHOMIROVA-SIDOROVA, N. S., Institute of Nuclear Physics, Academy of Sciences USSR, Institute of High Molecular Weight Compounds, Academy of Sciences USSR, and All-Union Scientific Research Influenza Institute, Ministry of Public Health USSR, Leningrad

"Molecular Weight Characteristics of the Polyriboguanilic-Polyribocytidylic Acid Complex and Their Relation to Antiviral and Interferonogenic Activity"

Moscow, Voprosy Virusologii, No 3, May/Jun 1973, pp 350-355

Abstract: Molecular weight characteristics and immunological activity of (poly-G)·(poly-C) were studied in comparison to those of (poly-I)·(poly-C) to determine the reasons for variations in the compound's immunological activity. It was found through gel chromatography that the molecular weight of the complex depended directly on the quantity of oligonucleotide impurities within either of the precursors, poly-G acid or poly-C acid. While impure precursors produce a complex with molecular weight 300,000-500,000 daltons, purification of both results in molecular weight close to that of (poly-I)·(poly-C) (over $1 \cdot 10^6$ daltons). Antiviral activity of the purified complex in white mice was practically identical to that of

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TIMKOVSKIY, A. L., et al., Voprosy Virusologii, No 3, May/Jun 1973, pp 350-355

(poly-I)·(poly-C). Activity also depended directly on precursor molecular weight, disappearing at 30,000-40,000 daltons. It is suggested that molecular weight is more important than nucleotide composition to antiviral and interferonogenic activity. Thus although the mechanism of action of both complexes remains to be clarified, apparently it is identical for both and depends directly on complex molecular weight and precursor purity.

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USSR

UDC 575

BRESLER, S. Ye., Professor, Doctor of Chemical Sciences, Head of the Laboratory of Biopolymers, Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences USSR, and Chairman at the Leningrad Polytechnical Institute

"Horizons in Molecular Genetics"

Moscow, Priroda, No 1, 1972, pp 27-39

Abstract: The rapid progress made in molecular biology can be regarded as the 20th Century's second revolution in natural sciences, revealing the most fundamental aspects of live matter: structure and synthesis of proteins and nucleic acids, mutation, recombination, and the genetic code. Technology is trying to keep pace with scientific development, and a new discipline -- biotechnology -- is emerging.

Campbell's mechanism, which explains how exogenous genetic information is incorporated into a cell, has opened the path to molecular hybridization of nucleic acid chains. Formation of transductant phages gave rise to the method of isolating and synthesizing genes. As a result, experimental genetics, which so far has been based on mutagenesis and crossing, is now entering new research avenues: isolation and synthesis of genes and incorporation of exogenous

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BRESLER, S. Ye., Priroda, No 1, 1972, pp 27-39

genetic information into cells. Numerous practical advantages may ensue from these manipulations. Bacteria may be induced to produce hormones, enzymes, and antibodies needed for therapeutic purposes. Defective human genes responsible for hereditary diseases may be corrected. Cancerogenic viruses, in which DNA transcription proceeds from RNA by means of reverse transcriptase, may be neutralized. Spontaneous mutations -- replication errors made by bacterial DNA polymerase at the rate of one per 10^9 nucleic bonds or one per 24 hrs -- can be accelerated to create new bacterial populations with desired properties within short periods.

Mutagenesis is particularly effective when it is induced during recombination. Thus, certain mutagens which were believed to be specific for phages proved effective mutagens for E. coli if applied during postconjugational recombination.

Analysis of occasional nonobservance of reciprocity during recombination of neighboring markers -- a development called genetic conversion -- yielded very valuable information. Exonucleases separate the double DNA chain into two single chains. If the genetic markers are located in these separated

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BRESLER, S. Ye., Priroda, No 1, 1972, pp 27-39

segments, then, after the segments are reunited by covalent bonds, new molecular structures called molecular heterozygotes are formed. Subsequently, one of three possible developments may take place. The heterozygote may persist and, after duplication and segregation, give rise to mixed progeny. A correction may be effected by appropriate enzymes to form a new text and give rise to pure recombined progeny. Finally, the correction may reestablish the old text, and no transformation of the cell takes place. Quantitative investigation of the probability of transformations yields information on the effects of various agents on genetic conversion.

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Genetics

USSR

UDC 576.8.095.5

BRESLER, S. Ya., LANTSOV, V. A., and MANUKYAN, L. R., Institute of High Molecular Compounds, Academy of Sciences USSR, Leningrad

"The Mechanism of Genetic Recombination During Bacterial Conjugation. III. Clonal Analysis of the Meterogeneous Progeny of Exconjugants Bearing a System of Close Genetic Markers"

Moscow, Genetika, Vol 6, No 8, Aug 70, pp 116-134

Abstract: During the conjugation of Escherichia coli Hfr and F⁻ cells, merozygotes are formed which replicate as diploids and segregate recombinants. The segregation process is completed in 8-10 generations. Two possibilities of zygote formation may be assumed: 1) tandem insertion of a DNA donor fragment into the recipient chromosome by a process similar to the Campbell mechanism; 2) parallel insertion, in which the donor fragment remains in a state of synapsis along the recipient chromosome. Specific predictions can be formulated for both schemes. In experiments on the conjugation of E. coli Hfr and F⁻ cells, five closely located genetic markers (three prophage and two bacterial) were employed. All of the groups found in the clonal analysis of 60 exconjugants were in agreement with the predictions for the tandem insertion mechanism. Since the statistical data were not extensive, the conclusions reached were qualitative. However,

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BRESLER, S. Ye., et al, Genetika, Vol 6, No 8, Aug 70, pp 116-134

calculations showed that the probability of a random fluctuation leading to the same correlation was less than 4%.

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Acc. Nr:

AP0045617

Abstracting Service: 3/70

CHEMICAL ABST.

Ref. Code:

NE 0000

62736q Inactivation and mutagenesis of isolated DNA. V. Importance of repairing enzymes for the inactivation of transforming DNA in vitro. ~~Bresler, S. E.~~ Kalinin, V. L.; Perumov, D. A. (Inst. High Mol. Weight Compounds, Leningrad, USSR). *Mutat. Res.* 1970, 9(1), 1-19 (Eng). The role of repair enzymes in the inactivation rate of transforming DNA was studied. Comparative studies were carried out on recipient strains with and without dark repair (*hcr*⁻ and *uvr*⁻). Pronounced dark repair was found for lesions induced in vitro in DNA by uv irradiation, HNO₃, Me₂SO, and N-methyl-N'-nitro-N-nitrosoguanidine. On the other hand, after treatment with NH₄OH and pancreatic DNase, the residual transforming activity was the same when assayed on *uvr*⁻, *uvr*⁻ or *hcr*⁻ as hosts. Recombinogens (moderate uv irradiation and mitomycin C) were used on recipient cells to enhance genetic recombination and the rescue of genetic markers during transformation. Both effects changed in parallel as a function of the recipient cells' survival. A quantitative estimation shows that the rescue of inactivated DNA is due partly to DNA repair and partly to increased recombination frequency. Finally, photoreactivating enzyme from bakers' yeast acts not only on inactivating damage induced in transforming DNA by uv irradiation, but also on mutational events generated by irradiation in vitro. This observation confirms that pyrimidine dimers are the main lesions in both conditions. RCMR

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REEL/FRAME

19780594

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1/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--SYNTHESIS OF POLYLYSINE IN THE CELL FREE SYSTEM FROM E. COLI -U-

AUTHOR--(04)-BRESLER, S.YE, GRAYEVSKAYA, R.A., MEREMAA, L.A., SAMINSKIY,
YE.M.

COUNTRY OF INFO--USSR

SOURCE--MOLEKULYARNAYA BIOLOGIYA, 1970, VOL 4, NR 2, PP 190-200

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ESCHERICHIA COLI, BIOCHEMISTRY, RIBOSOME

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1987/0098

STEP NO--UR/0463/70/004/002/0190/0200

CIRC ACCESSION NO--AP0103778

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--19SEP70

CIRC ACCESSION NO--AP0103778

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLYA DIRECTED SYNTHESIS OF POLYLYSINE IN THE CELL FREE SYSTEM FROM E. COLI WAS STUDIED. IT HAS BEEN SHOWN THAT THE MOLECULAR WEIGHT DISTRIBUTION OF THE SYNTHESIZED PRODUCTS IS INDEPENDENT ON INCUBATION TIME AND THE TOTAL NUMBER OF POLYLYSINE CHAINS EXCEEDS THE NUMBER OF RIBOSOMES IN THE INCUBATION MIXTURE. IT MEANS THAT IN THE COURSE OF THE REACTION A CHAIN TERMINATION MECHANISM OF UNKNOWN ORIGIN IS INVOLVED. THIS LEADS TO THE DISSOCIATION OF ACTIVE RIBOSOME COMPLEX AND RELEASE OF THE POLYLYSYL-TRNA WHICH IS INACTIVE IN THE DISPLACEMENT REACTION WITH PUROMYCIN. AFTER THAT THE INITIATION OF A NEW CHAIN ON A FREE RIBOSOME TAKES PLACE. DUE TO THIS THE TIME OF INDIVIDUAL CHAIN GROWTH IS SMALL AS COMPARED TO THE FULL INCUBATION TIME AND THE CHAINS ARE SHORT. THE OVERALL KINETICS OF POLYLYSINE SYNTHESIS REFLECTS KINETICS OF INITIATION OF NEW CHAINS RATHER THAN THAT OF INDIVIDUAL CHAINS GROWTH. THE RATE OF INITIATION DECREASES GRADUALLY WITH THE TIME OF INCUBATION AND CAN BE PARTIALLY RESTORED AFTER NEW ADDITION OF POLYA, ATP, GTP, TRNA.

UNCLASSIFIED

B

USSR

UDC 547.963.3

ERESLER, S. Ye., KALININ, V. L., and PERUMOV, D. A., Institute of High-Molecular Compounds, Academy of Sciences USSR

"Penetration of Bacillus subtilus Cells by Inactivated DNA During Transformation"

Moscow, Molekulyarnaya Biologiya, No 3, 1970, pp 414-421

Abstract: Six inactivating agents (UV light, nitrous acid, dimethylsulfate, hydroxylamine, pancreatic desoxyribonuclease I, and hydrodynamic fragmentation) perceptibly decreased the capacity of DNA to penetrate Bacillus subtilis cells. For example, treatment with hydroxylamine decreased the capacity of DNA to penetrate the cells by 10 to 15%. However, these agents had little influence on the irreversible uptake of DNA by competent cells. A 100-fold decrease in transforming activity reduced the DNA uptake by the recipient cells by 10 to 80%. It was shown that the method of competitive suppression of transformation can be used to measure the capacity of competing DNA to penetrate competent cells, when lethal injuries can be prevented from being incorporated into chromosomes of recipient cells.

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1/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--PENETRATION OF INACTIVATED DNA INTO COMPETENT CELLS OF BACILUS
SUBTILIS IN THE COURSE OF TRANSFORMATION -U-
AUTHOR-(03)-BRESLER, S.YE., KALININ, V.L., PERUMOV, D.A.
COUNTRY OF INFO--USSR *B*
SOURCE--MOLEKULYARNAYA BIOLOGIYA, 1970, VOL 4, NR 3, PP 414-421
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--DNA, BACILLUS SUBTILIS, PHOSPHORUS ISOTOPE, CHEMICAL
LABELLING, CHEMICAL DECOMPOSITION, CHROMOSOME
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1998/0185 STEP NO--UR/0463/70/004/003/0414/0421
CIRC ACCESSION NO--AP0120883
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120883

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DECREASE IN THE ABILITY OF TRANSFORMING DNA TO PENETRATE INTO COMPETENT CELLS OF BACILLUS SUBTILIS UNDER THE INFLUENCE OF INACTIVATING AGENTS (UV LIGHT, NITROUS ACID, DIMETHYLSULFATE, HYDROXYLAMINE OR HYDRODYNAMIC SHEARING) WAS STUDIED USING A PRIME32 P LABELED DNA PREPARATION. IT WAS SHOWN THAT CHEMICAL OR PHYSICAL MODIFICATION OF ISOLATED DNA CAUSES A DRASTIC LOSS OF TRANSFORMING ACTIVITY BUT ONLY SLIGHT CHANGE OF IRREVERSIBLE DNA UPTAKE BY COMPETENT CELLS. WHEN TRANSFORMING ACTIVITY IS REDUCED 100 FOLD THE EXTENT OF PENETRATION INTO COMPETENT CELLS DECREASES ONLY FOR 10-80PERCENT. IT WAS CONFIRMED BY DIRECT MEASUREMENTS THAT THE STUDY OF THE COMPETITION OF A GENETICALLY INACTIVE DNA WITH THE TRANSFORMING ONE GIVES GOOD RESULTS FOR THE ESTIMATION OF DNA UPTAKE IN THE CASE WHEN LETHAL HITS ARE PREVENTED FROM INTEGRATION INTO THE RECIPIENT CHROMOSOME. FACILITY: INSTITUTE OF HIGH MOLECULAR WEIGHT COMPOUNDS, ACADEMY OF SCIENCES, USSR, LENINGRAD.

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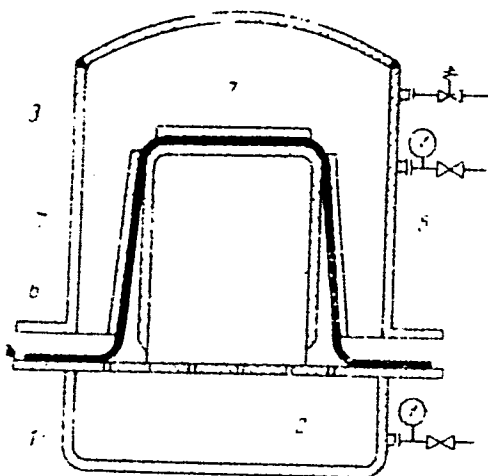
Soviet Inventions Illustrated, Section I Chemical, Derwent,
2/70

244596 PRODUCTION PRESS FOR GLASS FIBRE
REINFORCED PLASTICS to deal with large
items ensures high grade surface by means of an
elastic membrane (6) fitted with metal plates
(7) which load the blank so as to smooth out
uneven places. The plunger (5) is covered in a
parting layer and an upper filler impregnated
with binder. The blank is then covered in the
parting film, the membrane placed in position
with the platens and moved onto the press table (2)
The load chamber (3) is lowered and the clamps
locked shut and vacuum created, leading to the
press operation, smoothing etc. The clamps
are opened and the formed blank removed.

21.2.67. as 1135529/23-5, BRESLER, V.A. and
SHALEN, G.B. (7.10.69.) Bul. 18/28.5.69. Class
39a² Int. Cl. B 29c.

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USSR

UDC 542.91:541.69:547.1'118:547.9

VOLKOVA, R. I., KARDANOV, N. A., BRESTKIN, A. P., GODOVIKOV, N. N., and KABACHNIK, M. I., Institute of Organochemical Compounds, Academy of Sciences USSR and Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenova, Academy of Sciences USSR

"Reaction of S-(ω -Ethylmercaptoalkyl)diphenylthiophosphinates, O-(ω -Ethylmercaptoalkyl)diphenylphosphinates and Their Methyl Iodates With Cholinesterase From the Serum of Horse Blood"

Moscow, Seriya Khimicheskaya, 9, 1973, pp 2114-2119

Abstract: The kinetic constants were determined for the combined inhibition of butyrylcholinesterase by the diphenylthiophosphinates $(C_6H_5)_2P(O)S(CH_2)_nSC_2H_5$ and their methyl iodates $(C_6H_5)_2P(O)S(CH_2)_nS^+(CH_3)C_2H_5 \cdot I^-$ for $n = 2$ to 6. The constant for the reversible inhibition by the analogous oxygen ethers was also determined. The ability of the diphenylthiophosphinates, diphenylphosphinates and their methyl iodates to reverse the sorption on the active sites of the increases with increasing number of (CH_2) units. The rate constant for the nonreversible inhibition does not change significantly as n increases for the sulfide thioethers but in the sulfonium thioethers, it decreases with a decrease in the rate constant for their base hydrolyses.

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- 30 -

USSR

UDC 577.150.8:577.153.4:615.785.4

TONKOPIY, V. D., SAVATEYEV, N. V., BRESTKIN, A. P., and PANOV, A. N.,
Military Medical Academy Imeni S. M. Kirov, Institute of Evolutional
Physiology and Biochemistry Imeni I. M. Sechenov, Academy of Sciences
USSR, Leningrad

"Determination of Cholinesterase Activity in Tissues of Animals After the
Action of Reversible Inhibitors"

Moscow, Doklady Akademii Nauk SSSR, Vol 207, No 3, Nov 72, pp 736-738

Abstract: A new method was developed for the determination of cholinesterase activity after introduction of reversible inhibitors, based on their ability to retard cholinesterase activity with irreversible organophosphorus inhibitors [POI]. The inhibition of the enzyme -- j -- can be determined by the rate of cholinesterase hydrolysis of acetylcholine after addition of POI to the investigated tissue in absence of and after addition of the reversible inhibitor. The formula for the cholinesterase inhibition is:

$$j, \% = 100 - \frac{\lg v_1/v_{t,i} \cdot 100}{\lg v_0/v_t}$$

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TONKOPIY, V. D., et al., Doklady Akademii Nauk SSSR, Vol 207, No 3, Nov 72, pp 736-738

where v_1 represents respective rates of enzyme hydrolysis; v_0 -- in absence of inhibitors, v_t -- after incubation with POI, v_i -- in presence of reversible inhibitor, and $v_{t,i}$ -- in presence of reversible inhibitor followed by incubation with POI. Animal experiments were carried out on the inhibition of cholinesterase in blood and brain. Considerable depression of cholinesterase activity was noted with armine as the irreversible inhibitor and galantamine as the reversible one, corresponding to clinical symptoms. The Hestrin and potentiometric titration methods showed no depression of enzyme activity.

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USSR

UDC 577.153

BRESTKIN, A. P., ROZENGART, E. V., SOBOLEVA, I. N., KHROMOV-BORISOV, N. V.,
INDENBON, M. L., TIKHONOVA, L. N., ABDUVAKHAEV, A. A., and TOREMURATOV, K.,
Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenova,
Academy of Sciences USSR, Institute of Experimental Medicine, Academy of
Medical Sciences USSR, Leningrad, and Tashkent State University imeni V. I.
Lenin

"Unproductive Bonding of Cholinesterase Substrate"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 3, 1972, pp 717-720

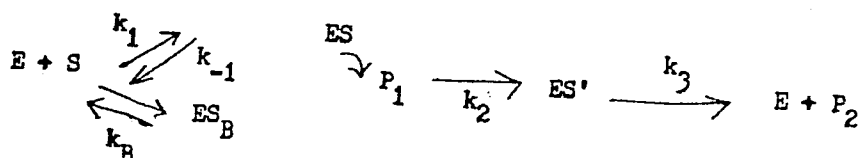
Abstract: Experiments have shown that the rate-limiting step in the Michaelis-Menton substrate reaction is the acylation or deacylation rather than the initial formation of the Michaelis complex. The specificity of the cholinesterase is also determined by the latter steps in the reaction and it is only the L optical isomer of acetyl- β -methylcholine which is hydrolyzed by the acetylcholinesterase. The D isomer is an inhibitor as it is adsorbed on the active sites but not subsequently removed. The system can be generalized as follows:

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BRESTKIN, A. P., et al., Doklady Akademii Nauk SSSR, Vol 205, No 3, 1972, pp 717-720



where E is the enzyme; S, the substrate; ES, the Michaelis complex; ES', the acylating enzyme; ES_B, the unproductive complex; and P₁ and P₂, the products of the reaction - alcohols and acids. The general implications of differences in the relative magnitudes of k₁, k₋₁, k₂, k₃, and k_B are presented. Actual data are given for five substrates.

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BRESTKIN, A. P.

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where [I] is the inhibitor concentration in the tissue studied, and K_i is the inhibitor constant.

It would seem that the simplest way to determine the magnitude of J would be by the reduction of ChE activity in the tissue sample in relation to the substrate — the acetylcholine (ACh), for example. If the concentration of the substrate [S] is relatively low and does not yet reduce the enzyme's catalytic effect (inhibition by an excess of substrate is characteristic of acetylcholinesterase), then the relation of V_0 to V_i , the rate of enzymatic reaction before administration of I, to V_i , the rate of enzymatic

$$I = \frac{[I]}{[E]} = \frac{[I]}{K_i + [I]} \quad (1)$$

Some reversible cholinesterase (ChE) inhibitors, including pilanthamine, tacrine, and others, are found in wide use in symptomatology and experimental studies. When studying the relationship between the anticholinesterase activity of reversible inhibitors (I) and their biological effect, it is extremely important to know the degree of enzyme inhibition (J) in various organs and tissues of the organism following ingestion of these inhibitors. The magnitude of J represents the relation of ChE concentration combined in the enzyme-inhibitor complex [EI] to the total enzyme concentration [E]₀, and in the case of a competitive type of inhibitor, is expressed in the formula:

Article by V. D. Tomokov, N. V. Smirnov, A. P. Brestkin, and A. M. Panov, Academy of Military Medicine, S. M. Arsenyev Institute of Military Physiology and Biochemistry, I. M. Sechenov, Academy of Sciences USSR, Leningrad (presented by Academician Ye. M. Krepe, 27 February 1972); Kasnov, Doklady Akademii Nauk SSSR, Russian, Vol 207, No 3, 1972, pp 736-738

INTERFERING CHOLINESTERASE ACTIVITY IN ANIMALS' TISSUES
FOLLOWING THE ACTION OF REVERSIBLE INHIBITORS

UDC 577.150.8:577.153.4:615.759.4

UDC 58045

23 January 1973

USSR

B Organophosphorus Compounds

UDC: 577.153

BRESTKIN, A. P., BRIK, I. L., VOLKOVA, R. I., MAYZEL', YE. B. and ROZENGARD, YE. V.,
Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Academy
of Sciences USSR, Leningrad

"Effects of the Ionic Strength and Organic Solvents on the Interaction of Cholinesterases with Substrates and Organophosphorus Inhibitors"

Moscow, Biokhimiya, Vol 35, No 2, Mar-Apr 70, pp 382-393

Abstract: The effect of various concentrations of KCl on the reactivity of acetylcholinesterase (A) from bovine erythrocytes and butyrylcholinesterase (B) from equine blood serum with respect to two substrates, acetylcholine and phenyl acetate, and two organophosphorus inhibitors, $C_2H_5(CH_3)P(O)SC_2H_4SC_2H_5$ (Gd-7) and $C_2H_5O(CH_3)P(O)SC_2H_4S^+(CH_3)C_2H_5 \cdot CH_3^-$ (Gd-42), was studied. With increasing concentrations of KCl, the reactivity of A and B decreased towards the cationic substrate acetylcholine and Gd-42 because of a decrease in the Coulomb interaction with the anionic center of the enzymes, whereas it increased towards the non-cationic substrate PhOAc and Gd-7 because of an increase in hydrophobic interaction with the hydrophobic sections of the active surface of the enzymes. In the acidic

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BRESTKIN, A. P., et al, Biokhimiya, Vol 35, No 2, Mar-Apr 70, pp 382-393

pH range, in which ionization of the anionic center was depressed, the inhibiting effect of KCl on the rate of the reaction of A and B with Gd-42 was less pronounced. Changes in the effect of the ionic strength at pH 5.5-8.2 on the inhibiting action of Gd-42 towards A and B made it possible to estimate the pK of the anionic center of A and B at 6.1 and 6.8, respectively. The effects of C_2H_5OH , C_3H_7OH , iso- C_3H_7OH , C_4H_9OH , iso- C_4H_9OH , sec- C_4H_9OH , and tert- C_4H_9OH on the anticholinesterase activity of organophosphorus inhibitors $C_2H_5O(CH_3)_2P(O)S(CH_2)_nC(CH_3)_3$ (series LG) and $C_2H_{2n+1}O(CH_3)_2P(O)SC_4H_9$ (series GA) were studied in experiments with B. The alcohols reduced the anticholinesterase activity of the organophosphorus compounds by worsening their hydrophobic interaction with the non-polar sections of B and also by altering the structure of these sections. The hydrophobic section in the region of the esterase center of B was more resistant to the action of alcohols than that in the region of the anionic center. The maximum effect in reducing the activity in the series LG was produced by iso- C_4H_9OH , to which hydrophobic regions in the region of the anionic center are particularly sensitive, while the maximum

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BRESTKIN, A. P., et al, Biokhimiya, Vol 35, No 2, Mar-Apr 70, pp 382-393
effect in reducing activity in the series GA was exerted by tert-C₄H₉OH, which
affects primarily the region of the esterase center.

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BRESTKIN, A. P.

JPRS 55330
2 March 1972

INTERACTION OF HYDROPHOBIC ORGANOPHOSPHOROUS INHIBITORS
AND SERUM CHOLINESTERASE IN THE PRESENCE OF
ALIPHATIC ALCOHOLS AT DIFFERENT pH

[Article by A. P. Brestkin, Ye. B. Mavrel', and Ye. V. Rozenart, Institute of Evolutionary Physiology and Biochemistry, Imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad; Moscow, Biohimiya, Russian, Vol 30, No 6, 1971, pp 1229-1232]

A study was made on the effect of 0.54 M isopropyl, n-butyl, and t-butyl alcohols on the activity of organophosphorous inhibitors (OPT) of the LG series: $C_2H_5O(CH_2)_nP(O)(S(CH_2)_nCH_3)_2$ (n = 2, 4, 6) and the GA series: $C_2H_5O(CH_2)_nP(O)(S(CH_2)_nCH_3)_2$ (n = 3, 7, and 10) to inhibit cholinesterase at different pH (9.0, 6.0, 7.5, 8.5, and 9.5). The pH dependence of OPT effectiveness is a bell-shaped curve with an indistinct maximum in the pH range of 7.5 to 9. It was demonstrated that for all the pH studied, these alcohols had the same effect on the structure of the hydrophobic sections in the region of the anionic and esteratic centers of the active surface of cholinesterase extracted from horse blood serum.

Earlier [1-4] we studied the effect of aliphatic alcohols on the anticholinesterase effectiveness of several hydrophobic organophosphorous inhibitors (OPT). An investigation of both OPT series [5] (LG series and GA series) enabled us to evaluate the effect of these alcohols on the structure of the hydrophobic sections situated in the anionic and esteratic region of the cholinesterase (Ch) active surface of horse blood serum (KF 3.1.1.8) [4].

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[I - USSR - D]

USSR

UDC 615.285.7.089.036.11.085.835.3

SAVATAYEV, N. V., BRESTKINA, L. M., TONKOPIY, V. D., POZHARISSKAYA, T. D., and
FROLOV, S. F.

"Compressed Oxygen in the Treatment of Acute Chlorophos Poisoning"

Moscow, Farmakologiya i Toksikologiya, No 6, 1972, pp 738-741

Abstract: Injection of rats with the pesticide chlorophos (1000 mg/kg) produced the characteristic symptoms of organophosphorus poisoning in 10 minutes. Administration of oxygen under normal barometric pressure at this time had no effect on the symptoms, but it slightly increased the animals' survival time. On the other hand, oxygen under a pressure of 3 atm not only mitigated the course of the intoxication, but increased the survival time substantially. Atropine alone or administered in combination with oxygen 10 min after injection of chlorophos had no effect on the outcome of the poisoning, although it greatly relieved the symptoms. Compressed oxygen and atropine used separately 60 min after poisoning had no effect on the course or outcome, but when the two were used at the same time, they produced a marked therapeutic effect and a higher survival rate. Treatment of the animals with atropine and TMB-4 resulted in a 90 to 100% survival rate. And when the two agents were combined with oxygen, the animals were outwardly indistinguishable from controls after only 1 hour in the pressure chamber.

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Acc. Nr.

AP0042049

Abstracting Service:

CHEMICAL ABST.

B 4/70

Ref. Code

4R0366

89693k Synthesis of thiocarbonyl fluoride by the co-pyrolysis of sodium perfluoropropionate with sulfur. Gubanov, V. A.; Dolgopolskii, I. M.; Brettske, E. B. (USSR). Zh. Org. Khim. 1970, 6(1), 185 (Russ). The pyrolysis at 600-700° of tablets prepd. by compressing powd. $F_3CCF_2CO_2Na$ with S, gave $\leq 26\%$ F_2CS , $CF_2:CF_2$, $F_3CCF:CF_2$, perfluorocyclobutane, and 1,1,2,2-tetrafluoro-3,4-dithiacyclobutane. All these products can be formed from $F_2C:$ or by its reactions with S. CPJR

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REEL/FRAME

19751946

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1/2 032 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--COMPARATIVE CHARACTERISTICS OF THE IONOSPHERES OF THE PLANETS OF
THE TERRESTRIAL GROUP, MARS, VENUS, AND THE EARTH, K -U-
AUTHOR--(02)-GRINGAUZ, I., BREUS, T.K.
COUNTRY OF INFO--USSR *B*
SOURCE--SPACE SCIENCE REVIEWS, VOL. 10, JUNE 1970, P. 743-769
DATE PUBLISHED----JUN70
SUBJECT AREAS--ATMOSPHERIC SCIENCES, ASTRONOMY, ASTROPHYSICS
TOPIC TAGS--IONOSPHERE, MARS PLANET, VENUS PLANET, EARTH PLANET, CHARGED
PARTICLE, ELECTRON DENSITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PRUXY REEL/FRAE--2000/1480 STEP NO--NE/0000/70/010/000/0743/0769
CIRC ACCESSION NO--AP0125108
UNCLASSIFIED

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PROCESSING DATE--2300170

CIRC ACCESSION NO--AP0125108

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REVIEW OF THE STAGE OF INVESTIGATIONS OF THE IONOSPHERES OF THE PLANETS OF THE TERRESTRIAL GROUP. THE TECHNIQUES OF INVESTIGATING PLANETARY IONOSPHERES BY MEANS OF SPACE VEHICLES ARE CONSIDERED, AND EXPERIMENTAL RESULTS OF THESE INVESTIGATIONS ARE PRESENTED AND INTERPRETED. A COMPARISON OF THESE RESULTS IS MADE, AND GENERAL CONCLUSIONS REGARDING SOME CHARACTERISTICS OF THE PLANETARY IONOSPHERES ARE DERIVED. THEY PARTICULARLY CONCERN THE ALTITUDE DISTRIBUTIONS OF THE CHARGED PARTICLE DENSITY ON THE SUNLIT AND DARK SIDES OF VENUS AND THE DAYTIME IONOSPHERE OF MARS, THE DENSITY AND EXTENSION OF THE PLANETARY IONOSPHERES, THE ALTITUDE OF MAXIMUM ELECTRON DENSITY, AND THE ALTITUDE OF THE OUTER BOUNDARY OF THE THERMAL PLASMA IN THE IONOSPHERE OF VENUS. FACILITY: AKADEMIIA NAUK SSSR, RADIOTEKHNIЧЕСKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 669.18:621.746

SOBKIN, S. I., NGSOV, V. A., ISUPOV, V. F., BREUS, V. M., CHEPURNOVA,
A. A., GROMOV, G. P., and ISMANOVA, T. A.

"Certain Factors Influencing the Increase in Density and Purity of Boiler
Steel Ingots"

Proizvodstvo Chernykh Metallov (Production of Ferrous Metals--- Collection
of Works), no 75, Metallurgiya Press, 1970, pp 240-251

Translation: A study is made of four ingots melted by the scrap process,
the scrap ore process, and from a high-carbon semi-finished product of
100% cast iron with synthetic slag treatment of the semi-finished product
and steel, cast under a layer of slag with heating of the riser of the
ingot by lunkerite or an exothermic mixture and lunkerite in combination
with heat insulation of the mold with asbestos.

The influence of these factors on the segregation of chemical ele-
ments, gas content, content of nonmetallic inclusions, density and dendritic
structure of the ingot is established. 8 figures; 2 biblio. refs.

1/1

USSR

UDC 621.762.4.001

ADADUROV, G. A., BREUSOV, O. N., DREMIN, A. N., and DROBYSHEV, V. N., Institute of New Chemical Problems, Academy of Sciences USSR, Affiliate of Institute of Chemical Physics, Academy of Sciences USSR

"Influence of Shock Waves of Refractory Compounds. I. Nitrides of Niobium, Zirconium, Silicon, Chromium and Gallium"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 71-73

Abstract: The influence of shock compression on the nitrides of gallium, zirconium, silicon, chromium, and niobium was studied. It was demonstrated that all of the materials studied are converted from powders to strong bars with high micro-porosity under the influence of shock compression. It is established that gallium nitride decomposes into its elements, while zirconium and silicon nitrides undergo no visible changes, and the quality of the crystalline lattice of chromium nitride is significantly decreased. The hexagonal epsilon phase of niobium nitride is converted to the cubic delta phase by shock compression.

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Increase of compressibility can be seen in other experiments, for example, by phase transformation with some liquid. The hypothesis that shock compression can lead to phase transformation was first made after consideration of the curve of shock compressibility (shock adiabat).

The instability of shock compression between phase transition and the dynamic strength limit moves the transition to lower pressures, but not to the point of instability. For example, the dynamic strength limit of the dynamic yield limit can be compared with the curve of the shock compression rate of its strength of shock effect of phase transition.

To avoid the influence of the dynamic strength on the form of the shock adiabat curve, it was proposed to compare the curve with another substance, collectively called as the shock adiabat curve of which is known. In this case, the influence of the dynamic strength substance is dynamically compensated.

During breakdown of material into blocks, delicate structures are ground to dimensions sometimes hard to observe by other means. Finally suspended to particles with dimensions of 0.1-10 microns, whereas 24-hour pulverization in a ball mill leads to the formation of far larger particles (100-100 microns).

High rates of loading and crushing of a solid lead to the formation on the front of the shock wave of an enormous concentration of structural defects of various types. The formation of certain types of structural defects, for example, the association of vacancies, directly on the front of the shock wave has been demonstrated experimentally. For that purpose a theory was made of the role of the direction of the pressure during the pulsed compression of the crystal and it was shown that shock process behind the front of a shock wave requires in 10⁻⁸ to 10⁻⁶ microns x seconds, which results in the formation of a large contribution of energy of a higher order, capable of absorption efficiently excited electrons of the front.

The abundance of various defects in a material, formed during shock compression, substantially influences its physical-chemical properties. Dislocation of the initial structure is reflected in different ways. Many times a considerable narrowing of x-ray photographs has been noted, a formation of the pyroelectric density and of the refractive index, intensification of absorption bands on the infrared spectra and other effects.

USSR

UDC 621.762.4.001

ADADUROV, G. A., BREUSOV, O. N., DREMIN, A. N., and DROBYSHEV, V. N., Institute of New Chemical Problems, Academy of Sciences USSR, Affiliate of Institute of Chemical Physics, Academy of Sciences USSR

"Influence of Shock Waves of Refractory Compounds. I. Nitrides of Niobium, Zirconium, Silicon, Chromium and Gallium"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 71-73

Abstract: The influence of shock compression on the nitrides of gallium, zirconium, silicon, chromium, and niobium was studied. It was demonstrated that all of the materials studied are converted from powders to strong bars with high micro-porosity under the influence of shock compression. It is established that gallium nitride decomposes into its elements, while zirconium and silicon nitrides undergo no visible changes, and the quality of the crystalline lattice of chromium nitride is significantly decreased. The hexagonal epsilon phase of niobium nitride is converted to the cubic delta phase by shock compression.

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1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--THERMAL DECOMPOSITION OF CHLORATES, BROMATES, IODATES,
PERCHLORATES, AND PERIODATES OF POTASSIUM, RUBIDIUM, AND CESIUM -U-
AUTHOR-(03)-BREUSOV, O.N., KASHINA, N.I., REVZINA, T.V.
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(3) 612-14
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--THERMAL DECOMPOSITION, RUBIDIUM COMPOUND, POTASSIUM COMPOUND,
CESIUM COMPOUND, CHLORATE, BROMATE, PERCHLORATE, IODATE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1994/1872 STEP NO--UR/0078/70/015/003/0612/0614
CIRC ACCESSION NO--AP0115691
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0115691

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMAL DECOMP. OF M (M EQUALS K, R6, AND CS) CHLORATES, BROMATES, IODATES, PERCHLORATES, AND PERIODATES WERE STUDIED BY DTA, THERMOGRAVIMETRY, AND BY EVOLVED GAS DETECTION. THESE COMPODS. DECOMP. WHEN MELTED AND THEIR THERMAL STABILITY INCREASED IN THE ORDER: MIO SUB4 SMALLER THAN MBRO SUB3 SMALLER THAN MCLO SUB3 SMALLER THAN MIO SUB3 SMALLER THAN MCIO SUB4. WITH THE EXCEPTION OF PERCHLORATES AND IODATES, ALL THESE COMPODS. EVOLVED GREAT ENERGY DURING THE INITIAL CLEAVAGE OF O, WHICH MADE THEM EXPLOSIVE.

UNCLASSIFIED

USSR

UDC 577.4

AFANAS'YEV, V. B., ~~BREUSOV, V. I.~~

"Structure of the Model of a Decoder for Implementation on a Digital Computer in a System with Successive Decoding"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 38-47 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V460)

Translation: A version of the Fano algorithm is described in which in order to decrease the complexity of implementing successive decoding on an all-purpose digital computer it is proposed that a table of statistically ordered error vectors be used.

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1/2 012 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--PLATINUM (IV) DIAMMINE DICHLORO COMPLEX CONVERSIONS IN SOLUTIONS
-U-
AUTHOR--(03)-ZHELIGOVSKAYA, N.N., BREUSOVA, YU.G., KANTER, T.M.
COUNTRY OF INFO--USSR
SOURCE--VESTN. MOSK. UNIV., KHIM. 1970, 11(1), 32-7
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--PLATINUM, AMMONIA, HYDROLYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1987/1096 STEP NO--UP/0189/70/011/001/0032/0037
CIRC ACCESSION NO--AP0104494
UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--19SEP70
CIRC ACCESSION NO--AP0104494
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACID DISSOCN. CONSTS. OF (PTCL
SUB3(H SUB2 O) (NH SUB3)SUB2) PRIME POSITIVE AND (PT(OH)CL SUB2(H SUB2
O)(NH SUB3)SUB2) PRIME POSITIVE ARE DETD. THE COMPLEXES ARE FORMED AS A
RESULT OF HYDROLYSIS OF (PTCL SUB3(NO SUB2)(NH SUB3)SUB2), (PTCL SUB4(NH
SUB3)SUB2), (PT(OH)CL SUB3 (NH SUB3)SUB2), AND (PT(OH)CL SUB2(NO SUB3)
(NH SUB3)SUB2). HYDROLYSIS CONSTS. FOR THE 4 COMPS. ARE 2.04 TIMES 10
PRIME NEGATIVE6, 5.68 TIMES 10 PRIME NEGATIVE5, 9.47 TIMES 10 PRIME
NEGATIVE7 AND 1.39 TIMES 10 PRIME NEGATIVE6, RESP. AT 25DEGREES.

UNCLASSIFIED

USSR

UDC: 577.1:615.7/9

BREVDA, D.I., and GOOVA, L.F.

"Sugar Content of Dog Blood in Acute Lead and Zinc Poisoning"

Tr. Sev.-Osetinsk. med. in-ta (Works of North Osetinian Medical Institute), 1969,
vyp. 24, pp 57-61 (from RZh-Biologicheskaya Khimiya, No 9, 1970, Abstract No
9F2015 by G.V.)

Translation: Fluctuations are reported in glycemia curves according to the phase
of action of lead and zinc upon dog organism.

1/1

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1/2 073 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--IONIZATION BEHIND A SHOCK WAVE FRONT IN ARGON -U-
AUTHOR-(04)-KUCHMANOVA, L.V., BREIDO, TS.G., GORYACHEV, V.L., SUKHOV, G.S.
COUNTRY OF INFO--USSR
SOURCE--ZH. TEKH. FIZ. 1970, 40(3), 600-4
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--IONIZATION, SHOCK WAVE, SHOCK WAVE PHYSICS, ARGON, MACH
NUMBER, GAS PRESSURE, ELECTRIC CONDUCTIVITY, PLASMA CONDUCTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1992/1443 STEP NO--UR/0057/70/040/003/0600/0604
CIRC ACCESSION NO--AP0112437
UNCLASSIFIED

2/2 073

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0112437

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. A STUDY WAS MADE OF THE IONIZATION EQUIL. BEHIND A SHOCK WAVE FRONT IN AR FOR PRESSURES OF 1-10 MM AND MACH NOS. OF 8.8-11. THE SHOCK WAVE WAS SET UP IN THE DIAPHRAGM TUBE DESCRIBED PREVIOUSLY (G., AND S., 1967). AN INCREASE IN THE MACH NO. AND TEMP. BEHIND THE WAVE OWING TO THE DECREASE IN THE INITIAL GAS PRESSURE IN THE LOW PRESSURE CHANNEL RESULTS IN AN INCREASE IN THE ELEC. COND. OF THE PLASMA ONLY UP TO A CERTAIN PRESSURE. BELOW THIS PRESSURE, THE DECAY OF THE PLASMA SETS IN EARLIER THAN THE EQUIL. VALUE OF THE ELECTRON CONCN. IS REACHED AND THEREFORE THE COND. DECREASES. THE OPTIMUM STARTING PRESSURE FOR THE AR (FOR THE MAX. COND.) IS 5 MM HG.

UNCLASSIFIED

USSR

BREY, V. V., DOROGOVITSEV, A. Ya., MAKOVETSKIY, O. A., POGORELYY, L. V.

"Optimal Selection of a Cutting Interval"

Teoriya Veroyatnostey i Mat. Stat. Mezhd. Nauch. sb. [Theory of Probabilities and Mathematical Statistics, Interdepartmental Scientific Collection], 1972, No 7, pp 14-22 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1975, Abstract No 1 V142 by the authors).

Translation: Let $\xi_1, \xi_2, \dots, \xi_n, \dots$ be a sequence of independent, identically distributed random quantities, having exponential distribution and sequence $\xi_1, \xi_1 + \xi_2, \xi_1 + \xi_2 + \xi_3, \dots, \xi_1 + \xi_2 + \dots + \xi_n, \dots$ of points in $[0, \infty)$; let τ be the number of points in the sequence of partial sums falling in the intervals

$$[\sigma, \sigma + \tau], [2\sigma + \tau, 2\sigma + 2\tau], \dots \\ \dots, [N\sigma + (N-1)\tau, N\sigma + N\tau] \quad (N(\sigma + \tau) = L$$

fixed, N is a positive integer). The problem is studied of determining the minimum value of τ for which the inequality $P(\nu \geq k) \geq p$ (k and p are fixed), and also the definition of the minimum τ for which there is at least one point in each of the intervals with a fixed probability.

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USSR

UDC: 519.2

BREY, V. V., NAGORNYI, V. N., POGORELYI, L. V., YADRENKO, M. I.

"On Modeling Some Classes of Random Processes"

Vychisl. i prikl. mat. Mezhved. nauch. sb. (Computational and Applied Mathematics. Interdepartmental Scientific Collection), 1972, vyp. 17, pp 39-50 (from RZh-Kibernetika, No 10, Oct 72, abstract No 10V199 [authors' abstract])

Translation: Computational formulas are presented for digital computer modeling of Gaussian stationary processes with correlation functions

$$B(\tau) = e^{-a|\tau|}, \quad B(\tau) = e^{-a|\tau|} \cos b\tau,$$

$$B(\tau) = e^{-a|\tau|} \left(\cos b\tau + \frac{a}{b} \sin b|\tau| \right).$$

1/1

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BREYEV, I. M.

18-160/5-118-73 24

Permurov, V. D., and Ye. Ye. Solodkin,
Axially-symmetric bodies with minimum
resistance at a specific heat flow to the
surface. IN: Uchenyye zapiski Tsentrāl'no-
 go aëro-gidrodinamicheskogo instituta, v. 2,
 no. 6, 1971, 32-40. (RZhMekh, 5/72,
 no. 5B345)

For axially-symmetric bodies with a flat leading edge and a mildly sloping lateral surface, an approximate solution is given to a variational problem of the shape of a body of minimal resistance in a hypersonic gas under a specific total heat flow to the surface. A modified Newtonian formula is used for calculation of the pressure distribution. The formulated isoperimetric problem of the shape of an axially-symmetric body of given dimensions with a flat leading edge, and minimum resistance at a given total heat flux, is solved numerically by a modified method of local variations at values of $Ma \approx 6$, 10, and 30, and $Ro \approx 10^6$. It is shown that, under the specified conditions, the requirements of minimal resistance and minimal heat flow to the body surface are contradictory.

Popov, F. D., and I. M. Breyev. Calculation
of supersonic flow around blunt bodies by the
finite-difference method. IN: Trudy II
 Respublikanskoy konferentsii po aerogidromekhanike,
 teplotnemu i massovomu. Set'siya "Aerodinamika
 bol'shikh skorostey". Kiyev, Kiyevskiy universitet,
 1971, 50-55. (RZhMekh, 5/72, no. 5B336)

A finite-difference scheme is proposed for the calculation of static, mixed, axially-symmetric flow over the nose section of a blunt body in a supersonic ideal gas. The shock layer considered is transformed

USSR

UDC 533.601

BREYEV, I. M., POPOV, F. D.,

"Finite-Difference Scheme for Calculating Steady State Flows Behind a Departed Shock Wave"

Trudy Leningradskogo Politekhnikeskogo Instituta, Aerotermodinamika
(Works of the Leningrad Polytechnical Institute, Aerothermodynamics),
No 313, 1970, pp 13-20

Translation: This paper introduces a finite-difference scheme for calculating a steady-state mixed (up to supersonic) flow behind a departed shock wave. In solving the difference equations, the method of matrix expansion is used. Here, considering the elliptic nature of the problem, the system of difference equations is not expanded during the iteration process into equations along individual rays, but it is solved along all the rays simultaneously. Accordingly, the matrix expansion method is generalized to the case where the matrices are cellular. The calculations demonstrated that by comparison with other methods, the proposed scheme insured high accuracy of the calculations with significantly

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USSR

BREYEV, I. M., et al., Trudy Leningradskogo Politekhnikheskogo Institute,
Aerothermodinamika(Works of the Leningrad Polytechnical Institute, Aero-
thermodynamics), No 313, 1970, pp 13-20

lower expenditures of machine time. There are two tables, 1 illustration and a 5-entry bibliography.

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Powder Metallurgy

USSR

UDC 662.611

POPOV, YE. I. and BREYTER, A. L., Moscow

"Flammability of Aluminum-Nickel Powders"

Kiev, Poroshkovaya Metallurgiya, No 5, May 73, pp 101-106

Abstract: The flammability of Al-Ni powders produced by atomization of a molten melt was studied. Attention was given to the following: 1) temperature of powder self-combustion in a layer as determined by differential thermal analysis where the investigated powder was gradually heated in a furnace; 2) combustion temperature of air-suspended powder as determined by directing the powder onto a heated surface in an air medium; 3) minimum concentration limit of explosiveness using a device of original design making it possible to create a uniform concentration of a dust cloud. It was determined that the characteristics of Al-Ni powder combustion depend essentially on their chemical composition. With increased Ni content, the temperature of self-combustion in a layer, temperature of air-suspended combustion, and minimum concentration limit of explosiveness increase continuously. These characteristics also depend on powder dispersity, particle shape, and oxide-film thickness. The mechanisms of combustion for the different characteristics can be explained by the same physical and chemical properties: oxide film penetrability, alloy melting point, chemical activity, and metal volatility. The pyrophoric

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USSR

POPOV, YE. I., et al, Kiev, Poroshkovaya Metallurgiya, No 5, May 73, pp 101-106

magnitudes of Al-Ni powders were obtained in order to determine the temperatures and concentrations which can be safely used when working with these powders. 4 figures, 2 tables, 19 bibliographic references.

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USSR

POPOV, Ye. I., KASHPOROV, L. Ya., MAL'TSEV, V. M., and BREYTER,
A. L. UDC: 662.612

"Combustion Mechanism of Aluminum-Magnesium Alloy Particles"

Novosibirsk, Fizika gorennya i vzryva, No 2, 1973, pp 240-246

Abstract: An investigation is conducted of the combustion process of single aluminum-magnesium alloy particles under atmospheric pressure. The particles under test contained 5, 10, 20, 50, 70, 90, and 95% magnesium, and were made in spherical form of 100-600 μ in diameter. The method of the experiment was to place the particle to be tested on a sharp tungsten needle and roast it in air or in the flames of mixtures of ammonium perchlorate and in urotropin at temperatures of 2500, 2700, and 3100° K, with the combustion process observed through the cinema camera "Konvas" and the SKS-1. Photographs from the film strips are reproduced, and curves are plotted of the ratio of the particle glow zone radius to the radius of the original particle as a function of time, and of the relative duration of the first combustion stage as a function of the alloy composition. It is found that the combustion proceeds in two stages, with the magnesium burning out chiefly in the first stage and the aluminum in the second.

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USSR

UDC 536.46+659.715

~~BBEITER~~ A. L., KASHOROV, L. Ya., MAL'TSEV, V. M., POZHIL, P. F.,
POPOV, Ye. I., PEPEKIN, V. I., and STASHENKO, A. G., Moscow

"Burning of Single Particles of Aluminum-Magnesium Alloys in the
Flame of Oxidizer-Fuel Mixture"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71,
pp 222-227

Abstract : The burning of single particles of aluminum-magnesium alloys in the tongue of the flame of a mixture of ammonium perchlorate and urotropine of stoichiometric composition (88 % ammonium perchlorate and 12 % urotropine) was experimentally investigated. The investigation results are discussed by reference to photographs of typical tracks of burning particles and diagrams showing the dependences of the inflammation time lag and the particle fraction subjected to explosive burning on particle composition. From the viewpoint of complete burning by modified fuel on aluminum base, alloys with 30-45 % aluminum and 55-70 %

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USSR

BREYTER, A. L., KASHPOROV, L. Ya., et al., Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71, pp 222-227

magnesium are considered to be effective. The characteristics of burning of the metal component are determined by the nature of included metals: the permeability of its oxidic layers, reaction capability, surface activity, volatility, fusing temperature, density change by fusing, and the burning temperature. Five illustr., one table, 16 biblio. refs.

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Information Theory

USSR

UDC: 621.391.81

ZAYEZNYY, A. M., BREYTM, I. M., LIFSHITS, L. L.

"Methods of Accumulation and Their Use in Signal Processing"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications. Ministry of Communications of the USSR), 1970, vyp. 51, pp 14-22 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6A81)

Translation: Various storage systems used for data transmission over communications channels are classified. The most detailed analysis is devoted to systems of parametric accumulation where the useful information is contained in the values of several parameters of the carrier, and systems of aggregate accumulation based on the principle of equipment redundancy. Examples are considered. Resur.

USSR

UDC: 621.391.883.2

BREYTMAN I. M.

"Potential Interference Immunity of Reception of Multiparameter Signals by the Separation Method"

V sb. Materialy Nauch.-tekhn. konf. Leningr. elektrotekhn. in-t svyazi. Vyp. 1 (Materials of the Scientific and Technical Conference of Leningrad Electrical Engineering Institute of Communications--collection of works), Leningrad, 1971, pp 90-94 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A32)

Translation: The paper investigates problems of reception of multiparameter signals in a channel with selective fading. Expressions are derived for the probabilities of errors in the case of optimum reception of multiparameter signals. It is shown that in a channel with selective fading, the use of multiparameter signals is preferable to single-parameter signals. Resumé.

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USSR

UDC 621.391.812.3

BREYTMAN, I. M., FLEYSHER, S. M.

"Adaptive Reception of Signals With an Unknown Frequency in a Channel With Rapid Fading"

V sb. Materialy Nauch.-tekhn. konf. Leningr. elektrotekhn. in-tsvyazi. Vyp. 1 (Materials of the Scientific and Technical Conference of the Leningrad Electrical Engineering Institute of Communications--collection of works, No 1), Leningrad, 1971, pp 84-89 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A17)

Translation: Algorithms are derived for adaptive reception of signals which are segments of sinusoidal waveforms with unknown frequency in a channel with fast fading against a background of adaptive noise. Resumé.

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1/2 028 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--OHMIC RESISTANCE OF AN INHOMOGENEOUS PLASMA --U-
AUTHOR--(03)-BREYZMAN, B.N., MIRNOV, V.V., RYUTOV, D.D.
COUNTRY OF INFO--USSR **B**
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 5, PP 1770-1783
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRIC RESISTANCE, ELECTRIC CURRENT, PLASMA DYNAMICS, FREE
PATH, ELECTRON, ELECTRON CAPTURE, ELECTRIC CONDUCTIVITY, ELECTRON
COLLISION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3001/2230 STEP NO--UR/0056/70/058/005/1770/1783
CIRC ACCESSION NO--AP0127592
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0127592

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE FLOW OF A CURRENT THROUGH AN INHOMOGENEOUS PLASMA IS CONSIDERED UNDER CONDITIONS WHEN THE ELECTRON MEAN FREE PATH CONSIDERABLY EXCEEDS THE CHARACTERISTIC INHOMOGENEITY DIMENSIONS. IT IS SHOWN THAT THE PRESENCE OF A LARGE NUMBER OF CAPTURED ELECTRONS LEADS TO A STRONG INCREASE OF THE OHMIC RESISTANCE COMPARED TO THE CASE OF A HOMOGENEOUS PLASMA. THE EFFECTIVE CONDUCTIVITY IS CALCULATED BY SIMULTANEOUSLY TAKING INTO ACCOUNT ELECTRON ELECTRON AND ELECTRON HOLE COLLISIONS. THE SPATIAL DISTRIBUTION OF THE ELECTRIC FIELD APPLIED TO THE PLASMA IS FOUND. INSTITUT YADERNOY FIZIKI, SIBIRSKOGO OTDELENIYA, AKADEMII NAUK SSSR.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ISOTOPIC COMPOSITION OF HYDROGEN IN THE WATERS AND PETROLEUMS OF
THE APSHERON OIL AND GAS BEARING REGION -U-
AUTHOR--(05)-MEKHTIYEV, SH.F., BREZGUNOV, V.S., VLASOVA, L.S., RACHINSKIY,
M.Z., SOYFER, V.N.
COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., NEFT. GAZ 1970, 13(1), 3-6

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--ISOTOPE, HYDROGEN, PETROLEUM DEPOSIT, CRUDE OIL, NATURAL GAS,
GROUND WATER, HYDROCARBON, DEUTERIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1996/1640

STEP NO--IR/0152/70/013/001/0003/0006

CIRC ACCESSION NO--AT0118619

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--ATG118619

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AV. ISOTOPIC COMPN. OF H IN WATERS OF VARIOUS FORMATIONS VARIED FROM 1.04 TO 1.065 RELATIVE UNITS, BUT DID NOT DEPEND ON THEIR TYPE AND MINERALIZATION. THE RATHER HIGH CONTENT OF D IN THE WATERS OF ALL HORIZONS SHOWED THE STAGNANT CONDITIONS OF THE BASINS IN THE PRODUCTIVE STRATA, THE COMPN. BEING CLOSE TO THAT OF THE SEDIMENTATION WATERS. THE CONCN. OF D IN PETROLEUMS VARIED 0.86-1.01 (AV. 0.93) UNITS AND DID NOT DEPEND ON THEIR SP. GR., HYDROCARBON COMPN., AND OCCURRENCE DEPTH; THEREFORE, THE CAUSES OF THE VARIATION COULD NOT BE DETD. THE AV. D CONTENT OF CONDENSATES WAS 0.90 UNITS. FACILITY: AZERB. INST. NEFTI KHIM. IM. AZIZVEKOVA, BAKU, USSR.

UNCLASSIFIED

1/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--ROLE OF LIME AND FERTILIZERS IN INCREASING THE FERTILITY OF HIGH
MOOR PEAT SOILS -U-
AUTHOR-(02)-SKOROPANOV, S.G., BREZGUNOV, V.S. *B*
COUNTRY OF INFO--USSR
SOURCE--VESTSI AKAD. NAVUK BELARUS, SSR, SER. SEL'SKAGASPAD. NAVUK 1970,
(1), 28-32
DATE PUBLISHED-----70

SUBJECT AREAS--AGRICULTURE

TOPIC TAGS--SOIL STRUCTURE, CEREAL CROP, LEGUME CROP, TRACE ELEMENT,
MINERAL FERTILIZER, CALCIUM COMPOUND, AGRICULTURE CROP YIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605019/E02 STEP NO--UR/0530/70/000/001/0028/0032
CIRC ACCESSION NO--AP0140964
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140964

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FIELD AND POT EXPTS. WERE CONDUCTED TO STUDY THE EFFECT OF CA, CU, B, MN, MO, CO, ZN, P, K, AND N ON THE YIELD OF RYE, BARLEY, OATS, CLOVER, AND VETCH GROWN ON PEAT SOILS OF THE HIGH MOOR. TREATMENT WITH N-P-K WITHOUT CA WAS INSUFFICIENT TO PRODUCE ANY CROP ON THIS TYPE OF SOIL, THOUGH N-P-K-CA GAVE REASONABLY HIGH YIELDS. THE APPLICATION OF THE TRACE MINERALS IN ADDN. TO N-P-K-CA WAS BENEFICIAL. FERTILIZER MIXTS. GIVING MAX. YIELDS OF THE VARIOUS CROPS ARE REPORTED.

UNCLASSIFIED

USSR

UDC: 519.2

IONIN, G. L., BREZGUNOVA, N. M.

"A Single-Queue System With Repeated Demands in the Case of Γ -Distribution of Serving Duration"

Latv. mat. yezhegodnik (Latvian Mathematics Annual), 1972, 11, pp 65-71 (from RZh-Kibernetika, No 5, May 73, abstract No 5V80 by the authors)

Translation: An investigation is made of the probability characteristics of a single-queue system with repeated demands in the case of Γ -distribution of serving duration. The method of generating functions is used to find analytical expressions for the probability of losses of primary demands and the average number of sources of repeated demands.

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USSR

UDC 58.036

BREZHNEV, D. D., Academician, KISLYUK, M. M. (deceased), VOROB'YEVA, G. A., All Union Scientific Research Institute of Horticulture imeni N. I. Vavilov

"The Effect of Super Low Temperature (-195°C) on the Pollen of Various Plants"

Moscow, Doklady Vsesoyuznoy Ordена Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenin, No 5, 1970, pp 2-6

Abstract: Experiments were conducted with pollen of various ages carefully gathered from tomatoes, potatoes, cucumbers, onions, beets, sorrel, peas, cabbage, radishes and birches, and subjected to cryogenic temperatures (-195°C) with liquid nitrogen, for periods from one minute to a month. It was found that all specimens of pollen were more viable than controls. The fertilization rate was higher than in controls, the setting of fruit was good, the fruit was of good quality and seeds were better. In addition, cross pollination was effective. Old, inactive or dead pollen was stimulated by instantaneous freezing at cryogenic temperatures; it became active, and fertilized plants with resulting high-quality fruit. The stimulating effect of the temperature of liquid nitrogen (-195°C) was evident to a remarkable degree in all the specimens of pollen under investigation.

USSR

UDC 621.771.261

SICHEVOY, A. P., BABICH, V. K., BREZHNEV, L. A., PIROGOV, V. A.,
and OSIPOVICH, S. V.,

"Changes in the Properties of 45G Steel After Rolling on the
Three-Roller 120 Mill"

Dnepropetrovsk, Metallurgicheskaya i Gornorudnaya Promyshlennost',
No 6, Nov-Dec 70, p 38

Abstract: Properties of the 45G steel after heating, rolling and subsequent cooling under various conditions were investigated. Billets 115 mm in diameter and 600 mm long were heated at various heating rates up to 1150-1200° by the induction method, then subjected to shrinkage by rolling. The study of the macrostructure showed that sulfur and phosphorus distribution along the billet cross section was satisfactory, and the magnitude of general and central porosity did not exceed 2 points. Mechanical properties of the billets had not changed rolling and cooling under various conditions. It is concluded that low-carbon manganous steel in billets 115 mm in diameter can be rolled on three-roller transverse-spiral mills in accordance with the procedure used for carbon steels.

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1/2 021
TITLE--OBITUARY -U-

B UNCLASSIFIED

PROCESSING DATE--13NOV70

AUTHOR--(04)-BREZHNEV, L.I., VORONOV, G.I., KIRILENKO, A.P., KOSYGIN, A.N.

COUNTRY OF INFO--USSR

SOURCE--SOVETSKAYA ROSSIYA, JUNE 30, 1970, P 3, COLS 1-2

DATE PUBLISHED--30JUN70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY, BEHAVIORAL AND
SOCIAL SCIENCES

TOPIC TAGS--BIOPHYSICS, PHARMACOLOGY, BIOCHEMICAL PERSONNEL, CHEMICAL
PERSONNEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1993/0086

STEP NO--UR/9022/70/000/000/0003/0003

CIRC ACCESSION NO--AN0113064

UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0113064

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACADEMICIAN MIKHAIL MIKHAYLOVICH SHEMYAKIN, BORN IN 1908, HAS SUDDENLY DIED. THE OUTSTANDING SOVIET CHEMIST WAS ELECTED CORRESPONDING MEMBER OF THE ACADEMY OF SCIENCES, U.S.S.R. IN 1953. IN 1958 HE WAS ELECTED ACTIVE MEMBER OF THE ACADEMY.

SHEMYAKIN WAS THE ORGANIZER AND THE DIRECTOR OF THE INSTITUTE OF CHEMISTRY OF NATURAL COMPOUNDS, MEMBER OF THE PRESIDUM OF THE ACADEMY, SECRETARY OF THE DEPARTMENT OF BIOCHEMISTRY, BIOPHYSICS AND CHEMISTRY OF PHYSIOLOGICALLY ACTIVE COMPOUNDS OF THE SOVIET ACADEMY OF SCIENCES. SHEMYAKIN ALSO TAUGHT AT THE MOSCOW INSTITUTE OF FINE CHEMICAL TECHNOLOGY AND THE MOSCOW TEXTILE INSTITUTE.

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USSR

UDC 621.771.22.001.5

BREZHNEV, Ya. I., IVANCHENKO, F. K., and TYLKIN, M. A.

"An Investigation of the 550 Reduction Stand of the Light-Section Mill"

Moscow, Plasticheskaya Deformatisiya Metallov i Splavov, "Metallurgiya"
Publishing House, No. 64, 1970, pp 113-116

Translation: A comprehensive study was made of the 550 reduction stand of the light-section mill.

The amount of metal pressure on the rolls in different passes was determined, and on this basis checking calculations were made of the durability of the primary stand assemblies. Two illustrations and one table.

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BREZHNEV, V.S.

TECHNICAL TRANSLATION

11461 PSTC-HT-23-2315-72

(1)

ENGLISH TITLE: GEOMETRICAL THEORY OF GRAVITATION AND ELECTRICITY

RUSSIAN TITLE: GEOMETRICHESKAYA TEORIYA TYAGOTENIYA I ELEKTRICHESKAYA

AUTHOR: V. S. BREZHNEV

SOURCE: PROBLEMY TEORII GRAVITATSII I ELEMENTARNYKH CHASTITS, No. 3,
Atomizdat MOSCOW 1970, pp 75-102

Translated for JSTC by UNIVERSAL LANGUAGE SERVICES, INC.

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Nuclear Science and Technology

USSR

FRADKIN, G. M., BREZHNEVA, N. YE., YERSHOVA, Z. V., BOGDANOV, N. I. (Deceased), KODYUKOV, V. M., VORONIN, A. R., KOZLOV, A. G., MALYKH, YU. A., NIKIPELOV, B. V., RAGOZINSKIY, A. I., FEDOROV, V. V., and CHUSHKIN, YU. V., State Committee on the Use of Atomic Energy USSR, Fourth International Conference of the United Nations on the Peaceful Use of Atomic Energy, Geneva, 6-16 Sep 71

"Development of Isotopic Power Technology in the USSR"

Moscow, Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 358-365

Abstract: The construction in the USSR of isotopic thermoelectric generators for powering oceanographic and navigation devices, hydrographic, automatic radiometeorological, magnetic variation stations, high-elevation cosmic ray stations, and other scientific research stations and ground installations is reported on. The most suitable for fuel applications are isotopes with a half-life period within the limits 100 days to 100 years (approximately 50 isotopes), of which 12-15 can be obtained in large amounts. Most quantities of fission radioactive isotopes and also the most widely used radioactive Sr⁹⁰ are obtained by processing radioactive waste solutions. To simplify isolation of radiochemically pure elements, including Sr⁹⁰, the group concentration method is used, based on calcium oxalate precipitation. The most promising technique is extraction separation of alkaline-earth elements with the isolation of pure strontium. Here the following extractants are used: a

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FRADKIN, G.M., et al, Moscow, Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 358-365

solution of di-2-ethylhexylorthophosphoric acid in kerosene from a nitric acid medium, and a solution of salicylaldoxime in tributyl phosphate from an alkaline (sodium hydroxide or ammonia) solution. Currently construction has been completed for blocks with activities in the tens and hundreds of kilocuries based on Ce^{144} (20,000 curies), Sr^{90} (9000-100,000 curies), and Cs^{137} (50,000-150,000 curies), and also blocks based on Pu^{238} , Po^{210} , Cm^{242} , and Co^{60} . The thermal capacity of these blocks lies within the range 1-1000 watts. An empirical formula was derived and tested for the power yield in an isotopic (thermal) block. Also discussed is biological protection during development and construction of isotopic power sources containing kilocurie amounts of radioactive heat. In dealing with the conversion of radioactive decay energy, the thermoelectric method was found to be most fully mastered at present: low-temperatures semiconductor materials (up to 300°C) have been obtained with quite high efficiencies (5-8%), as well as medium-temperature (300-700°C) and high-temperature (higher than 700°C) semiconductor materials. Combining different materials in the form of cascade elements already permits attainment of 12-15% conversion efficiency in prototypes. Demands of minimum weight and size and also low background of attendant neutron and gamma-radiation led to construction of portable generators of the MIG-67 type based on Pu^{238} . The unique properties of Cm^{242} and Po^{210} (high specific power yield and fairly low-gamma-radiation intensity) made feasible construction of isotopic thermoelectric generators using cascaded converters with efficiencies of 8-10% in the 300-850°K range.

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FRADKIN, G. M., ~~BREZHNEVA, N. YE.~~, YERSHOVA, Z. V., BOGDANOV, N. I.
(Deceased), KUDYUKOV, V. M., VORONIN, A. N., KOZLOV, A. G., MALYKH, YU. A.,
NIKIPELOV, B. V., RAGOZINSKIY, A. I., FEDOROV, V. V. and CHUSHKIN, YU. V.,
State Committee for the Use of Atomic Energy USSR

"Advancement of Research in the Field of Nuclear Power Engineering in the
USSR (Report Presented at the Fourth United Nations International Conference
on the Peaceful Uses of Atomic Energy held 6 to 16 September 1971 in
Geneva)"

Moscow, Atomnaya energiya, Vol 31, no 4, Oct 71, pp 358-365

Abstract: This report cites data on the Soviet development of the thermo-
electric generators designed for feeding oceanographic and navigation
devices, hydrographic, automatic, radiometeorological, magnetic variation
stations, high-mountain cosmic ray stations, and other scientific research
land stations. The report covers the scientific and technical fundamentals
of such energy sources and cites the characteristics of some generators.
Discussed in some detail are various aspects of radio isotopic fuels,
selection, properties, distinctive characteristics, evaluation, requirements,
cost factors, availability, handling safety factors, and forms of applica-
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FRADKIN, G. M., et al, Atomnaya energiya, Vol 31, no 4, Oct 71, pp 358-365

tion. The potential use of extraction separation of alkali-earth elements for obtaining pure strontium is noted. A table lists the comparative characteristics of various isotopes having potential use in thermoelectric generators. Much consideration is given to topics dealing with energy release in an isotopic unit, biological protection, radioactive decay energy conversion, thermal flow chart selection, and generator designs. Described and illustrated are some thermoelectric generators of various designations (using Ce^{144} , Cs^{137} , Sr^{90} , Pu^{238} , Cm^{242} (Po^{210})) including Beta-1, Beta-2, Beta-C, Efir, Penguin, MIG-67 (portable-type), and generators with cascade converters. (8 illustrations).

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USSR

UDC 541.127:543.544.6:546.65

BREZHNEVA, N. YE., DEMENT'YEV, V. D., KAPSHANINOV, YU. I., and POPOV, I. B.

"Ion Exchange Kinetics of Rare Earth Elements on NaX Zeolite"

Leningrad, Radiokhimiya, Vol 13, No 4, 1971, pp 525-530

Abstract: Ion exchange kinetics of La^{3+} , Ce^{3+} , Pr^{3+} , Nd^{3+} and Sm^{3+} on the synthetic zeolite NaX was studied. It was shown that the determining step in ion exchange process is the stage of the penetration of ions into the ion exchange resin. The diffusion coefficients are constant for each ion up to 50% of exchange; they increase with rising exchange temperature and are inversely proportional to the ionic radius. The function $\log D_i - \frac{1}{T}$ is linear for all ions in the temperature range studied. The activation energy of this process decreases proportionately to the decrease in ionic radius. It was shown that the cations are not dehydrated in the ion exchange process. By extrapolation the energy of activation and coefficient D_0 for the diffusion of Pm^{3+} ion into the NaX zeolite have been determined.

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USSR

UDC 66.074.7:546.65

BREZHNEVA, N. Ye., DEMENT'YEV, V. D., KAPSHANINOV, Yu. I., and POPOV, I. B.

"A Study of Ion Exchange Between Ceolites and Radioactive Rare Earth Elements"

Leningrad, Radiokhimiya, Vol XIII, No 3, 1971, pp 411-416

Abstract: Synthetic zeolites, which have greater radiation-chemical and thermal resistance than organic resins, are of particular interest in connection with their use in various areas of radiochemistry, especially their application in the sorption decontamination of radioactive waste, in the extraction of radioisotopes to concentrate them before burial, and in obtaining radiation sources. However, in regard to ion-exchange, no one has been able to secure substitution of the zeolite Na^+ and Ca^{2+} ions with the ions of a metal having a valence greater than 1 or 2, with the exception of the 27% exchange for A-type zeolite, and 60% exchange for X-type zeolite, achieved at the disadvantage of increase in the amorphous phase (trivalent cerium was the substitute ion). In the present study, previously dehydrated zeolite was used in conjunction with a complexing agent, on the assumption that the rare-earth ions would form with the agent adsorbed on the zeolite

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BREZHNEVA, N. Ye., et al., Radiokhimiya, Vol XIII, No 3, 1971, pp 411-416

just the same complexes as in a solution, while the complexes themselves, MeA^+ and MeA^{2+} , would behave as mono- and bivalent ions, and thus be capable of exchanges without the formation of a polar structure.

It is shown that maximum exchange capacity of NaX-type zeolites, for all elements studied, was the same (0.360 mg-equiv per 100 mg zeolite), and that the degree of substitution of Na ions was 82%. The following array of selectivity was found to be present: $\text{La}^{3+} > \text{Ce}^{3+} > \text{Pr}^{3+} > \text{Nd}^{3+} > \text{Pm}^{3+} > \text{Sm}^{3+}$; this holds up to about the level of 80% exchange, after which the order of selectivity is reversed. It was shown, further, that degree of exchange is quite independent of the concentration of the initial rare-earth element solution, at least within the range of solutions from 0.01 to 1 N. Finally, it was shown that the mobility of rare-earth ions in a zeolite is lower than that of sodium ions.

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1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--MIXTURE FOR PREPARING ARC, ARRESTER CHAMBERS FOR ELECTRICAL
APPARATUS -U-
AUTHOR-(04)-NAMITOKOV, K.K., BULGAKOV, V.A., MITSKEVICH, G.F., BREZINSKIY,
V.G.
COUNTRY OF INFO--USSR
SOURCE--U.S.S.R.267,436
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--01APR70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--ARC DISCHARGE, DISCHARGE CHAMBER, PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0885

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0132975

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0132975

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CHARGE FOR PREPG. ARC, ARRESTER
CHAMBERS FOR ELEC. APP. CONSISTED OF ASBESTOS 20-30, CEMENT 60-75, AND
ALK., EARTH METAL HALIDES 2-10 WT. PERCENT.

UNCLASSIFIED

BRIABRIN, V.M.

see BRYABRIN, V.M.